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Calibrating Charm Jet Tagging in ATLAS — Diptaparna Biswas, Carolina Costa, Markus Cristinziani, Carmen Diez Pardos, Ivor Fleck, Gabriel Gomes, Jan Joachim Hahn, Nikolaos Kamaras, Vadim Kostyukhin, Nils Benedikt Krengel, Austin Olson, •Inês Pinto, Sebastian Rentschler, Elisabeth Schopf, Katharina Voss, Wolfgang Walkowiak, and Adam Warnerbring — Experimentelle Teilchenphysik, Center for Particle Physics Siegen, Universität Siegen

Classifying jets according to the flavour of the initiating parton is essential for many ATLAS analyses involving b- and c-quarks. Recent developments employ end-to-end transformer architectures to improve jet flavour identification. In this talk, we present an alternative data-driven calibration of the c-jet tagging efficiency using the $W+c$ method, which selects $W+c$ events through a soft muon from the semi-leptonic decay of a charmed hadron. The charge correlation between the W boson and the charm quark strongly suppresses backgrounds, allowing a clean determination of the c-jet content. Unlike the standard $t\bar{t}$-based calibration, which is not suitable for Beyond the Standard Model top-quark studies, this method provides an independent and complementary handle on c-jet performance. We present current measurements of the c-jet efficiency, and the c-jet mis-identification efficiency in the case of b-jet identification, in data and simulation, and derive the corresponding scale factors.

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